

William R. Hutchison, PhD  
Director, Groundwater Resources  
Texas Water Development Board

Bill,

My question at the GMA 15 meeting on Wednesday was how the groundwater exempted under an aquifer exemption for in-situ uranium mining would be reported? I promised to send you additional information which I will address in this communication. This information and data is specific to and from the class III injection permit UR03075 and PAA-1 which has been approved by TCEQ and is currently under review by the EPA for the aquifer exemption.

The requested aquifer exemption is for 423.8 acres from a depth of 45 feet to 404 feet. There are four aquifer sands in this formation identified as sands A, B, C, and D in order from top to bottom. The average thickness of each of the four sands is 45 feet.  $423.8 \text{ acres} \times 4 \text{ sands} \times 45 \text{ feet} \times .28 \text{ percent porosity} = 21,360 \text{ acre feet of drinking water.}$

Within this 423.8 acre aquifer exemption boundary are the following defined uranium production areas.

Sand A – 22 acres, Sand B – 36.1 acres, Sand C – 13.7 acres, and Sand D – 68.4 acres.

Data provided by the mining company UEC, by TCEQ, and by expert witnesses at the contested case hearing all acknowledge that the baseline wells were placed strategically in the area where the respective ore bodies are located and that the wells are screened in the vertical segment where the ore is deposited. The screens are a maximum of 20 feet in vertical length while the average aquifer thickness as previously noted is 45 feet.

There has been much debate about the water quality in the ore body segment prior to exploration borehole drilling. The primary debate is whether the drilling of the exploration boreholes and the drilling and jetting of the cased baseline wells introduced enough oxygen into the aquifer to cause some uranium to be activated resulting in the liberation of daughter products.

There is no data, professional opinions, or any other basis to suggest that the water inside the aquifer exemption boundary and outside of the ore body is not drinking water quality. There are livestock wells inside the aquifer exemption area and these wells have tested as having drinking water quality water.

For purpose of addressing the question, the water in the immediate vicinity of the ore deposit may not meet drinking water standards. From page 8-8 of the PAA-1 (Sand B) application, the affected pore volume is described to be the area of the patterns x an open interval of 11 feet x .28 porosity x a 1.875 flare factor. This is equivalent to 82.3 acre feet of water volume. This volume represents the amount of one pore volume that is used to calculate restoration requirements. This also represents what is considered the area that will be contaminated during the injection circulation uranium recovery process.

The other three sands have not been delineated but by using a ratio of production area and the Sand B data, the pore volume (contaminated area) for Sand A is 50.2 acre feet, Sand C is 31.2 acre feet, and Sand D is 160 acre feet.

Summing the single calculated pore volumes (contaminated area) for the four sands = 323.7 acre feet. The aquifer exemption if granted as currently defined applies to 21,360 acre feet. The only claimed contaminated water is in the area of the ore bodies = 323.7 acre feet. By subtracting 323.7 acre feet from 21,360 acre feet = 21,036.3 acre feet of drinking water that by statute is unavailable.

How will the 21,036 acre feet of drinking water rendered unavailable by the aquifer exemption be treated in the GMA process?

Regards,  
Art Dohmann